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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,521	05/10/2002	Matthias Vierthaler	Mic.6055	5966

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Patrick J. O'Shea
O'Shea, Getz, & Kosakowski, P.C.
Suite 912
1500 Main Street
Springfield, MA 01115

EXAMINER	
SUTHERS, DOUGLAS JOHN	
ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 10/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/030,521	VIERTHALER ET AL.	
	Examiner	Art Unit	
	Douglas Suthers	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 August 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-21,24,26 and 29-32* is/are rejected.

7)☒ Claim(s) *22,23,27 and 28* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

2. Claims 1-12 have been cancelled. Claims 13-32 remain pending and are addressed in this office action.

Continued Examination Under 37 CFR 1.114

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on August 14th, and August 28th, 2006 have been entered.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 13-21, 24-26, and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blackmer (US 4182930) in view of smith et al (US 4000370).

6. Regarding claim 13, Blackmer discloses a method for processing an audio signal, comprising the steps of: band-limiting the received audio signal to generate a first intermediate signal (38); multiplying the first intermediate signal by a correction factor to generate a second intermediate signal (24); amplifying the second intermediate signal by an amplification factor to generate a third intermediate signal (52); band-limiting the third intermediate signal to generate a fourth intermediate signal (54); and adding the fourth intermediate signal to the received audio signal (20B).

Blackmer does not expressly disclose the use of a limiter.

Smith discloses the use of a limiter, limiting (22) the amplitude of an audio signal to a threshold value to generate a limited signal (column 1 lines 38-41) and providing a correction factor (resistance of 70) as a feedback signal that is a function of an amplified signal (from 20).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the limiter of Smith to limit the amplified signal of Blackmer. The motivation for doing so would have been to avoid distortion due to overloading. Therefore, it would have been obvious to combine Blackmer with Smith to obtain the invention as specified in the claim 13.

7. Regarding claim 14, the method of claim 13 is disclosed as above.

Smith discloses further comprising the step of: adjusting a correction factor (gain from 28 to 30) based on whether the signal exceeds a threshold value (column 2 lines 22-29, figure 3).

8. Regarding claim 15, the method of claim 14 is disclosed as above.

Smith discloses further comprising: reducing the correction factor when the amplified signal exceeds the threshold value (figure 3 above 100 DB).

9. Regarding claims 16, the method of claim 14 is disclosed as above.

Smith discloses further comprising: increasing said correction factor when said amplifying signal does not exceed said threshold value (figure 3 below 100 DB).

10. Regarding claims 17-18, the method of claim 14 is disclosed as above.

Blackmer discloses wherein said adjusting said correction factor comprises: generating a control variable based on an amplitude (46), and generating said correction factor (signal from 46) as a function of said control variable and wherein said generating a correction factor as a function of said control variable further comprises the step of low-pass filtering the control variable to generate the correction factor (48). Although Blackmer does not disclose that the amplitude of the third signal is used to generate the control variable, the amplitude detected by level detector 48 would be a function of the third signal. Therefore it would be obvious to one of ordinary skill in the art that it could be based on the third signal.

11. Regarding claims 19-20, the method of claim 13 is disclosed as above.

Blackmer discloses wherein the step of limiting the amplitude of the third intermediate signal to a threshold value comprises the steps of: generating harmonics of low-frequency signal components of the received audio signal (unit 14); and weighting said harmonics with a variable factor; wherein said weighting said harmonics with a variable factor comprises: generating said variable factor as a function of said third intermediate signal (responsive to signal energy, column 2 lines 46-51).

12. Regarding claim 21, the method of claim 19 is disclosed as above.

Blackmer discloses wherein said step of generating harmonics comprises: increasingly generating harmonics at the beginning of a low-frequency signal. If there were no low-frequency signal the control from 26 would be low. As low-frequency power increased, the signal would increase, increasing the gain of amplifier 24.

13. Regarding claim 24, Blackmer discloses a circuit for processing an input audio signal received at an input of the circuit to provide at an output of the circuit a processed audio signal, the circuit comprising: a first adder (20B) having first and second inputs and an output at which the processed audio signal is provided; a first conductive path (from 30B to 20B) connecting the circuit input to said first input of said first adder, where said first conductive path is constructed and arranged to deliver said received audio signal unaltered to said first adder; a second conductive path (from 30B to 34 to 20B)

connecting said circuit input to said second input of said first adder, said second conductive path including: a first bandpass filter (38) having an output and an input connected to said circuit input; a multiplier (24) having a first input connected to said first bandpass filter output, and a second input, and an output; a variable amplifier (52), having an output and an input connected to said multiplier output, for amplifying a signal received at said amplifier input in accordance with an amplification factor presented at a control input of said amplifier; and a second bandpass filter (54) having an input connected to said nonlinear circuit output and an output defining said circuit network output.

Blackmer does not expressly disclose the use of the non-linear circuit and function generator.

Smith discloses a nonlinear circuit limiting the amplitude of an amplifier output to a threshold value (items 78, 80, 82, 84, column 2 lines 22-29, figure 3) and a first function generator (60, gain function of figure 3) having an input connected to a control output of the first nonlinear circuit, and an output connected to the second input of the multiplier (52) where the first function generator provides a feedback signal representative of a correction factor to the second input of the multiplier (52) and where the feedback signal is a function of a signal at the control output of the first nonlinear circuit (to 68).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to include the limiter of Smith in the circuit of Blackmer. The motivation for doing so would have been to avoid distortion due to overloading. Therefore, it would

have been obvious to combine Blackmer with Smith to obtain the invention as specified in the claim 24.

14. Regarding claim 25, the circuit of claim 24 is disclosed as above.

Blackmer discloses wherein said first function generator comprises a first low-pass filter (48).

15. Regarding claim 26, the circuit arrangement of claim 24 is disclosed as above.

Blackmer does not disclose a second non-linear circuit. However the only difference between the non-linear circuit of claim 24 and the combination of both nonlinear circuits of claim 26 is that the nonlinear circuits are dependent on an additional function of their input. It is well known in the art that limiters may limit signal signals based on a plurality of measurements, positive and negative voltage for example. Therefore it would be obvious to have the first nonlinear circuit comprise: a second nonlinear circuit having an input and output connected to said input and output, respectively, of said first nonlinear circuit, a control output defining said control output of said first nonlinear circuit, and a control input to which said second nonlinear circuit is responsive; and a second function generator having an input connected to said input of said first nonlinear circuit and an output connected to said control input of said second nonlinear circuit.

16. Regarding claim 29, Blackmer discloses a circuit for processing an input audio signal received at an input of the circuit to provide at an output of the circuit a processed audio signal, the circuit comprising: means for band-limiting (38) the received audio signal to generate a first intermediate signal; means for multiplying (24) the first intermediate signal by a correction factor to generate a second intermediate signal; means for amplifying (52) the second intermediate signal by an amplification factor to generate a third intermediate signal; means for band-limiting said third intermediate signal to generate a fourth intermediate signal (54); and means for adding said fourth intermediate signal to said received audio signal (20B).

Blackmer does not expressly disclose a limiting means.

Smith discloses a means for limiting (22) the amplitude of an audio signal to a specified maximum value to generate an intermediate signal (column 2 lines 22-29) and a means for providing a correction factor (70) as a feedback signal that is a function of an amplified signal.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to limit the amplitude of the third signal of Blackmer with the limiter of Smith. The motivation for doing so would have been to avoid distortion due to overloading. Therefore, it would have been obvious to combine Blackmer with Smith to obtain the invention as specified in the claim 29.

17. Regarding claim 30, the circuit of claim 29 is disclosed as above.

Smith discloses further comprising: a means for adjusting a correction factor (gain from 28 to 30) based on whether said third intermediate signal exceeds a predetermined threshold value (figure 3 above 100 DB).

18. Regarding claim 31, the circuit of claim 30 is disclosed as above.

Smith discloses further comprising: means for reducing a correction factor when the signal exceeds said predetermined threshold value (figure 3 above 100 DB), and for increasing a correction factor when the signal is less than the predetermined threshold value (figure 3 below 100 DB).

19. Regarding claim 32, Blackmer discloses a circuit for processing an input audio signal received at an input of the circuit (10B) to provide at an output of the circuit a processed audio signal (after 20B), the circuit comprising: a first conductive path through which the received audio signal travels (from 30B to 20B); a second conductive path through which the received audio signal travels (from 30B to 34 to 20B), wherein the audio signal is processed such that harmonics of the signal components with a low-frequency are generated in the second path and are admixed to the signal in the first path, wherein in the second path the audio signal is sequentially bandpass filtered (38), weighted with a correction factor (24), amplified (52), and bandpass filtered (54).

Blackmer does not expressly disclose the use of a limiter.

Smith discloses wherein an audio signal is limited to a threshold value (column 2 lines 22-29), wherein the correction factor (gain from 28 to 30) is reduced when the

maximum value is exceeded (column 2 lines 22-29. figure 3 above 100 DB) and wherein where a correction factor (resistance of 70) is provided as a feedback signal that is a function of an amplified audio signal (to 22).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to include the limiter of Smith in the circuit of Blackmer. The motivation for doing so would have been to avoid distortion due to overloading. Therefore, it would have been obvious to combine Blackmer with Smith to obtain the invention as specified in the claim 32.

Response to Arguments

20. Applicant's arguments filed August 14th, 2006 have been fully considered but they are not persuasive. Applicants argues in general that there would be no motivation to combine the references, and that combing the references would make the Blacker no longer operate for it's intended purpose.

21. In response to applicant's argument that Smith is nonanalogous art to Blackmer, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, both are in the area of audio signal processing in the area of insuring an acceptable output range.

22. In response to applicant's argument that the combination of references makes the Blacker no longer operate for its intended purpose, the examiner notes that the intended purpose is to generate audio subharmonic frequency signals for improved audio signal reproduction (column 1 lines 4-7). Items 24 and 26 "determine whether a sufficient amount of energy is present within the frequency range of interest, i.e. between 40 and 100 Hz, and to control the amount of amplification of the subharmonics generated" (column 5 lines 23-28). Although the combination of references would do such in the same manner, it would achieve the above. Therefore Blackmer would still operate for its intended purpose. In fact, Blackmer would operate in its intended purpose even if items 24 and 26 were removed altogether.

Allowable Subject Matter

23. Claims 22-23, and 27-28 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

24. The following is a statement of reasons for the indication of allowable subject matter: These claims teach control of an audio circuit that adds low frequency harmonics, the control of which includes a peak detector that's signal is low pass filtered through two low pass filters in parallel, and subtracted from each other. Similar circuits in the state of the art such as Waller, Jr. (US 4696044), Williamson, III (US 5369711), and Watanabe (US 4790014) do not teach such.

Conclusion

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas Suthers whose telephone number is (571)272-0563. The examiner can normally be reached on 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571)272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

djs

VIVIAN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600